

# Hossein Rabbani

Senior Member,  
IEEE

**Professor**  
Department of Biomedical Engineering,  
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&  
Medical Image & Signal Processing  
Research Centre



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## Objective and Fields of Interest

- Objective** Research in multidimensional signal processing including biosignal analysis and modeling (especially medical image/volume), sparse transforms, noise reduction and estimation problem, image/video restoration, probability models of sparse domain's coefficients.
- Fields of interest** Biomedical signal analysis and processing including multidimensional data, time-frequency analysis tools including x-lets, denoising, statistical signal processing, applied mathematics (currently I am focusing on Statistical & Mathematical Modeling of Medical Signals and Systems).

## Academic Qualifications

- 2013 –2014** Postdoctoral Research Fellow, Duke Eye Center, Durham, United States.
- Research topic: **“Automatic Analysis of Various Types of Leakages in Fluorescein Angiograms and Optical Coherence Tomography (OCT)”**
  - Supervisor: Prof. Sina Farsiu
- 2011** Postdoctoral Research Scholar, The University of Iowa, Iowa, United States.
- Research topic: **“Optical Coherence Tomography (OCT) Image Analysis”**
  - Supervisors: Prof. Milan Sonka & Prof. Michael Abramoff
- 2007** Visiting Research Scholar, Electrical & Computer Engineering Department, Queen’s University, Kingston, Ontario, Canada.
- Research topic: **“Statistical modeling of sparse domain’s coefficients and its application to medical image/volume denoising”**
  - Supervisor: Prof. Saeed Gazor.

2002 – 2008

**Doctoral Researches, Bioelectronics**

**Department of Biomedical Engineering** (The Center of Excellence on Biomedical Engineering in Iran), **Amirkabir University of Technology** (Tehran Polytechnic), **Tehran, Iran.**

- Dissertation research topic: **“Medical Image/Volume Noise Reduction in Multidimensional Complex Wavelet Transform Domain Using Bivariate Mixture Models”**
- Supervisor: Prof. Mansur Vafadust
  
- Passed Ph.D. courses: advanced digital signal processing, biomedical signal processing, advanced biomedical signal processing, advanced digital image processing, advanced digital communication, spread spectrum, system identification, advanced neural network.
  
- Passed the qualifying examination in Sept. 2004.

2000 – 2002

**Master of Science, Bioelectronics**

**Department of Biomedical Engineering** (The Center of Excellence on Biomedical Engineering in Iran), **Amirkabir University of Technology** (Tehran Polytechnic), **Tehran, Iran.**

- Dissertation research topic: **“Video Restoration based on Motion Estimation in Complex Wavelet Domain”**
- Supervisor: Prof. Mansur Vafadust
- Advisor: Prof. Shohreh Kasaei
  
- Passed M.Sc. courses: digital signal processing, biomedical signal processing, digital image processing, medical imaging systems, stochastic processes, statistical pattern recognition, digital control systems, bioinstrument, and neural network.

1997 – 2000

**Bachelor of Science, Communication (1<sup>st</sup> rank)**

**Department of Electrical and Computer Engineering, Isfahan University of Technology, Isfahan, Iran.**

- Dissertation research topic: **“Designing and Constructing of Laser Communication between Two Computers”**

**Work Experience**

2003-2016

**Teaching**

- **Undergraduate level courses**  
(B.Sc. students, Amirkabir University of Technology):

- Statistics and probability
  - Analog and digital communication systems
- **Graduate level courses**  
(M.Sc. & Ph.D. students, Isfahan University of Medical Sciences):
- Advanced Biomedical Signal Processing
  - Biological Signal & System Modeling
  - Biomedical Signal Processing
  - Digital Image Processing
  - Digital Signal Processing
  - Information Technology in Biomedicine
  - Medical Image Processing & Analysis
  - Neural Networks
  - Pattern Recognition
  - Stochastic Processes
  - Sparse Transforms and Their Applications in Signal Processing
  - System Identification
  - Advanced Biological Signal & System Modeling
  - Convex Optimization

### **Supervising and Advising**

- **Supervisor:**

Postdoc projects (in progress):

- CS-based Hardware/Software development of OCT (A-scan, B-scan, C-scan)
- Automatic diagnosis of eye abnormalities by use of OCT and Fundus images
- Event detection from 24-hour multichannel intraluminal impedance pH monitoring by deep learning
- Designing a combinatory method (DL-based, Statistical-based, Sparse representation-based) for classification of DR
- Modeling of ocular images using optimum basis functions (DL & MCA)
- Intra-retinal layer and fluid segmentation of 3D OCT images by deep learning
- Quantitative analysis of hemorrhages in colour Fundus images
- Cyst detection in OCT images using mathematical models
- OCT modeling: statistical modeling vs. geometrical modeling vs. energy-based modeling
- Synchronized analysis of EEG, MRI images, and SPECT images of patients suffering from seizure

PhD dissertation researches:

- Combination of graph-based algorithms and time-frequency methods for processing of OCTs
- Seeking an appropriate feature extraction method for breast cancer recurrence prediction based on microarray gene expression data
- A new model based on Gaussianization of OCT data
- Automatic analysis of features of AMD in OCT images using 3D curvelet transform
- Automatic detection of acute myeloid leukemia in microscopic images using dictionary learning
- Automatic diagnosis of Mild Cognitive Impairment (MCI) by dictionary learning -based analysis of EEG signals
- 3D OCT Classification by Deep Learning
- Fully automated segmentation of fluid/cyst regions in OCT images using neutrosophic sets and graph algorithms
- 3D Sparse Reconstruction of Cone-beam CT
- Multivariate Statistical Modeling of OCT Images
- Energy-based Modeling of OCT Images
- Introducing a Novel System for Persian Signature Recognition (Offline and Online) and Its Verification Based on x-let Transforms
- Study on the Application of the Markov Model for Breast Cancer Modeling Using Gene Expression Data
- Sparse Representation of PH Monitoring Signals
- Modeling of Retinal OCT Based on Mixture of Stochastic Differential Equations
- Cyst Segmentation in OCT Images Using Deep Learning in Sparse Domains

PhD dissertation researches (in progress):

- Sparse Representation of OCT Images
- Obtaining Optimum Basis Functions for Modeling of OCT Images in Sparse Domains to Classify Abnormal and Normal Samples
- OCT Image Analysis by Deep Learning Based on Multivariate BKF Modeling
- 3D OCT Reconstruction by Compressive Sensing
- Retinal Optical Coherence Tomography Image Analysis Based on Combination of Statistical and Geometrical Modeling

M.Sc. dissertation researches:

- Detection of cystoid B-Scans in OCT Images using hidden Markov model and AlexNet
- Image restoration using Gaussian mixture models with neighborhood nonlocal clustering
- Evaluation of the symmetricity of cup to disk ratio in left and right eyes of normal subjects
- Mosaicing macula OCT images and OCT optical disk
- Designing a dictionary for OCT images based on K-SVD algorithm using texture characteristics of retinal layers for image segmentation
- Automatic segmentation of corneal layer boundaries in OCT images and obtaining 3D maps of the entire thickness of cornea and inner layers
- Automatic detection of leishman bodies in bone marrow samples from patients with visceral leishmaniasis using level set method
- Evaluation of asymmetricity of right and left eyes of normal subjects using extracted features from optical coherence tomography (OCT) and color fundus images
- Automatic diagnosis of malaria based on complete circle-ellipse fitting search algorithm
- Automatic segmentation and recognition of lung nodules in thoracic CT images using active contour modeling and convex hull
- Segmentation of enhanced depth imaging optical coherence tomography (EDI-OCT) images using graph cut algorithm based on Gaussian mixture model of wavelet features
- Forming projection images from retinal layers on the 3D optical coherence tomography (OCT) data and fusion of them using curvelet transform to form an optimal projection image
- Evaluation of image pre-compensation methods for enhancing visual efficiency in the presence of higher order ocular optical aberrations
- Extraction of 15-lead ECG signal from vectorcardiogram (VCG) signal using partial linear transformation for providing information from posterior side of the heart
- Detection of foveal avascular zone (FAZ) based on curvelet transform for grading of diabetic retinopathy
- Extraction of nucleolus candidate zone in white blood cells of peripheral blood smear images using curvelet transform
- A comparison between hp version of finite element method with EIDORS for electrical impedance tomography
- A comparison between ECG and VCG signals for detection of ischemia location
- Estimation of somatosensory evoked potentials with multi-adaptive filters

- A contourlet-based watermarking method for medical images
- Automatic detection of diabetic retinopathy by extraction of retinal image features in curvelet domain
- Estimating depth of anesthesia based on wavelet transform and neuro-fuzzy systems
- Microcalcification detection in mammographic images using fractal model in wavelet domain
- Persian script character recognition using PCA
- A comparison between ECG and VCG for detection of ischemia
- Automatic detection and recognition of lung nodule in CT image based on active contour
- Complexity analysis of EEG signals for Mild Cognitive Impairment (MCI) diagnosis
- 3D segmentation of proximal enamel lesions in micro-ct images
- Automatic analysis of tracheal acoustic signals for apnea detection and introducing new clinical indices of depth of sedation
- Statistical modeling of 3D OCT data by mixture model

B.Sc. dissertation research entitled:

- Angle detection for biomaterial based on image processing

- **Advisor:**

PhD dissertation researches:

- Retinal Image Registration of 3D OCT Volumes and Fluorescein Angiography Images
- Sparse Representation and Dictionary Learning for Super-resolution of OCT Images

M.Sc. dissertation researches entitled:

- Investigation and simulation of optical systems for Fundus photography of human eye by Cell phone camera
- Optimization of visual stimulus sequence in a Brain-Computer Interface based on code modulated visual evoked potentials
- Automatic detection of microaneurysms in OCT images
- Polyp detection/segmentation in video colonoscopy by convolutional neural network
- Transform based ellipse detection in microscopic images using elliptical basis functions
- Automatic extraction and recognition of myeloma cell in microscopic bone marrow aspiration images
- Extraction of candida fungus from pap smear images based on ridgelet transform for vulvovaginal candidiasis diagnosis
- Extraction of vessels, optic disc and fovea avascular zone from fundus fluorescein angiogram based on Hessian analysis of

directional curvelet subbands

- Medical image compression with multi-wavelet
- A new adaptive technique for fast and accurate estimation of SSAEP

## Honors

- I was really interested in studying mathematics before entering university and all of my grades in this field were excellent. I participated in the entrance exam of universities (1996).
  - My grades in this exam were:
    - ✓ Mathematics: **98/100**
    - ✓ Physics: **86.7/100**
    - ✓ Chemistry: **91.2/100**
  - I had this opportunity to choose **all of the best universities** in Iran.
- B.Sc. Degree with the honor of the **1<sup>st</sup> rank** from Isfahan University of Technology (2000).
- M.Sc. Degree with the honor of the **3<sup>rd</sup> rank** from Amirkabir University of Technology (2002).
- **1<sup>st</sup> rank** in the Ph.D. entrance exam of Amirkabir University of Technology in bioelectrics & Isfahan Univ. of Tech. in communications (2002).
- **Outstanding selected Ph.D. thesis** by Iranian Society for Biomedical Engineering (2008).
- The winner of **national prize of “Young Assistant Professors”** (2009).
- **IEEE, Elected Senior Member** (2013)
- **The winner of Avicenna Research Award**, Isfahan Univ. of Med. Sciences (2019)
- The recipient of **Georg Forster research fellowship for experienced researchers**, Alexander von Humboldt Foundation (2019).
- **The winner of Seed Money Grant with Switzerland Leading House**

## Membership

- ✓ IEEE Senior Member  
Signal Processing Society, Engineering in Medicine & Biology Society
- ✓ The Optical Society

## Article Reviewer

- ✓ IEEE Trans. on PAMI
- ✓ IEEE Trans. on Image Processing
- ✓ IEEE Trans. on Signal Processing
- ✓ IEEE Trans. on Medical Imaging
- ✓ IEEE Trans. on Biomedical Engineering
- ✓ IEEE Signal Processing Letters
- ✓ IEEE Reviews in Biomedical Engineering
- ✓ Medical Image Analysis
- ✓ ACM Computing Surveys Review
- ✓ IEEE Trans. on Geoscience & Remote Sensing
- ✓ IEEE Trans. on Circuits & Systems for Video Technology

- ✓ IEEE Trans. on Multimedia
- ✓ IEEE Trans. on Systems, Man, and Cybernetics-Part B: Cybernetics
- ✓ IEEE Trans. on Biomedical Circuits and Systems
- ✓ IEEE Journal of Biomedical and Health Informatics
- ✓ IEEE Access
- ✓ IEEE Trans. on Instrumentation & Measurement
- ✓ IET Image Processing Journal
- ✓ IET Signal Processing Journal
- ✓ IET Computer Vision
- ✓ Pattern Recognition
- ✓ Signal Processing
- ✓ Computers in Biology & Medicine
- ✓ Digital Signal Processing
- ✓ Biomedical Signal Processing & Control
- ✓ Pattern Recognition Letters
- ✓ Ultrasonics
- ✓ Journal of Biophotonics
- ✓ Journal of Biomedical Optics
- ✓ Measurement
- ✓ Computer Methods and Programs in Biomedicine,
- ✓ Journal of Visual Image Communication & Representation
- ✓ Applied Optics
- ✓ Optics Letters
- ✓ Journal of Optical Society of America A
- ✓ Applied Soft Computing
- ✓ Biomedical Optics Express
- ✓ PLOS ONE
- ✓ Journal of Medical Systems
- ✓ The Computer Journal
- ✓ Medical & Biological Engineering & Computing
- ✓ Neural Computing & Applications
- ✓ Journal of Applied Mathematics
- ✓ EURASIP Journal on Image and Video Processing
- ✓ Signal, Image and Video Processing
- ✓ Multidimensional Systems & Signal Processing
- ✓ Circuits, Systems & Signal Processing
- ✓ Current Medical Imaging Reviews
- ✓ International Journal of Pattern Recognition and Artificial Intelligence
- ✓ Journal of Innovative Optical Health Sciences
- ✓ Medical Principles & Practice
- ✓ Measurement Science Review
- ✓ Electronics Letters
- ✓ SPIE Journal of Medical Imaging
- ✓ Complexity
- ✓ Progress in Electromagnetic Research (PIER)
- ✓ BMC Open
- ✓ BMC Medical Imaging
- ✓ Biomedical Engineering OnLine
- ✓ International Journal of Imaging Systems and Technology
- ✓ Mathematical Problems in Engineering
- ✓ Cognitive Neurodynamics
- ✓ Journal on Modern Optics
- ✓ Optik
- ✓ Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization
- ✓ Journal of Research in Medical Sciences



- ✓ Iranian Journal of Biomedical Engineering
- ✓ Iranian Journal on Electrical & Computer Engineering

- ✓ Iranian Journal of Physics Research
- ✓ Several International IEEE Conferences and National Conferences

### Editorial Board Member:

- ✓ Journal of Medical Signals and Sensors (Editor-in-Chief)
- ✓ Diagnostics (Guest Editor)
- ✓ Frontiers in Ophthalmology (Associate Editor)

### Publications

#### International Journal Papers

1. M Monemian, **H Rabbani\***, “Detecting red-lesions from retinal fundus images using unique morphological features”, Scientific Reports, vol. 13, no. 1, pp. 3487, 2023.
2. A Abbasi, A Monadjemi, L Fang, **H Rabbani**, BJ Antony, H Ishikawa, “Mixed multiscale BM4D for three-dimensional optical coherence tomography denoising”, Computers in Biology and Medicine, vol. 155, pp. 106658, 2023.
3. M Monemian, **H Rabbani\***, “Exudate identification in retinal fundus images using precise textural verifications”, Scientific Reports, vol. 13, no. 1, pp. 2824, 2023.
4. P Havaei, M Zekri, E Mahmoudzadeh, **H Rabbani**, “An efficient deep learning framework for P300 evoked related potential detection in EEG signal,” Computer Methods and Programs in Biomedicine, vol. 229, pp. 107324, 2023.
5. N Mousavi, M Monemian, P Ghaderi Daneshmand, M. Mirmohammadsadeghi, M. Zekri, **H. Rabbani\***, “Cyst identification in retinal optical coherence tomography images using hidden Markov model”, Scientific Reports, vol. 13, no. 1, pp. 12, 2023.
6. R Darooei, M Nazari, R Kafieh, **H Rabbani\***, “Dual-Tree Complex Wavelet Input Transform for Cyst Segmentation in OCT Images Based on a Deep Learning Framework”, Photonics, vol. 10, no. 1, pp. 11, 2023.
7. M Monemian, **H Rabbani\***, “A Computationally Efficient Red-Lesion Extraction Method for Retinal Fundus Images”, IEEE Transactions on Instrumentation and Measurement, vol. 72, pp. 1-13, 2022.
8. M Tajmirriahi, Z Amini, **H Rabbani**, “Logarithmic Moments for Mixture of Symmetric Alpha Stable Modelling”, IEEE Signal Processing Letters, vol. 29, pp. 2527-2531, 2022.
9. M Aghanouri, N Dadashi Serej, **H Rabbani**, P Adibi, “Automatic esophagus Z - line delineation in endoscopic images using a new boundary linking method”, IET Image Processing, vol. 16, no. 14, pp. 3842-3853, 2022.

10. M Ezhei, G Plonka, **H Rabbani\***, “Retinal optical coherence tomography image analysis by a restricted Boltzmann machine”, *Biomedical Optics Express*, vol. 13, no. 9, pp. 4539-4558, 2022.
11. R Almasi, A Vafaei, E Kazeminasab, **H Rabbani\***, “Automatic detection of microaneurysms in optical coherence tomography images of retina using convolutional neural networks and transfer learning”, *Scientific Reports*, vol. 12, no. 1, pp. 1-11, 2022.
12. M Lashgari, **H Rabbani\***, G Plonka, I Selesnick, “Reconstruction of Connected Digital Lines Based on Constrained Regularization”, *IEEE Transactions on Image Processing*, vol. 31, pp. 5613-5628, 2022.
13. ES Kazeminasab, R Almasi, B Shoushtarian, E Golkar, **H Rabbani\***, “Automatic detection of microaneurysms in OCT images using bag of features”, *Computational and Mathematical Methods in Medicine*, pp. 1-10, 2022.
14. N Saeedizadeh, M Tajmirriahi, AR Haghani, Z Amini, E Khalili Pour, H Riazi-Esfahani, K Fadakar, R Kafieh, **H Rabbani**, “A Device-independent, Shape Preserving Retinal Optical Coherence Tomography Image Alignment Method Applying TV-Unet for RPE Layer Detection”, *IEEE Transactions on Instrumentation & Measurement*, vol. 71, pp. 1-8, 2022.
15. M Mirzapour, **H Rabbani**, “Investigation on accelerated ordered subsets image reconstruction techniques with superiorization methodology”, *The European Physical Journal Plus*, vol. 137, no. 7, pp. 791, 2022.
16. M Tajmirriahi, Z Amini, R Kafieh, Hossein Rabbani, A. Mirzazadeh, SH Javanmard, “Statistical inference of COVID-19 outbreak: Delay distribution effect in EQIR modeling of epidemic”, vol. 12, no. 2, pp. 95, 2022.
17. M Monemian, **H Rabbani\***, “Directional analysis of intensity changes for determining the existence of cyst in optical coherence tomography images”, *Scientific Reports*, vol. 12, no. 1, pp. 2105, 2022.
18. M Tajmirriahi, Z Amini, **H Rabbani**, R Kafieh, “An Interpretable Convolutional Neural Network for P300 Detection: Analysis of Time Frequency Features for Limited Data”, *IEEE Sensors Journal*, vol. 22, no. 9, pp. 8685-8692, 2022.
19. AH Riazi, **H Rabbani**, R Kafieh, “Dynamic Brain Connectivity in Resting-State FMRI Using Spectral ICA and Graph Approach: Application to Healthy Controls and Multiple Sclerosis”, *Diagnostics*, vol. 12, no. 9, pp. 2263, 2022.
20. N Teyfour, **H Rabbani\***, I Jabbari, “Low-dose cone-beam computed tomography reconstruction through a fast three-dimensional compressed sensing method based on the three-dimensional pseudo-polar Fourier transform”, *Journal of Medical Signals and Sensors*, vol. 12, no. 1, pp. 8, 2022.
21. M Monemian, **H Rabbani\***, “Red-lesion extraction in retinal fundus images by directional intensity changes’ analysis”, *Scientific Reports*, vol. 11, no. 1, pp. 18223, 2021.
22. S Jorjandi, Z Amini, G Plonka, **H Rabbani\***, “Statistical modeling of retinal optical coherence tomography using the Weibull mixture model”, *Biomedical Optics Express*, vol. 12, no. 9, pp. 5470-5488, 2021.
23. M. Montazerin, Z. Sajjadifar, E. Khalili Pour, H. Riazi-Esfahani, T. Mahmoudi, **H. Rabbani**, H. Movahedian, AR Dehghani, MR Akhlaghi, R. Kafieh, “Livelayr: A semi-automatic

- software program for segmentation of layers and diabetic macular edema in optical coherence tomography images”, *Scientific Reports*, vol. 11, no. 1, p. 13794, 2021.
24. R. Sharbati, H. R. Ramazi, F. Khoshnoudian, H. R. Amindavar & **H. Rabbani**, "Stochastic Model for Simulation of Ground-Motion Sequences Using Kernel-Based Smoothed Wavelet Transform and Gaussian Mixture Distribution", *Journal of Earthquake Engineering*, vol. 25, no. 12, pp. 2147-2177, 2021.
  25. A. Rasouli, **H. Rabbani\***, S. Kermani, M. Raisi, M. Soheilipour and P. Adibi, "A Multichannel Intraluminal Impedance Gastroesophageal Reflux Characterization Algorithm Based on Sparse Representation," *IEEE Journal of Biomedical and Health Informatics*. Vol. 25, no. 9, pp. 3576-3586, 2021.
  26. M. Tajmirriahi, Z. Amini\*, A. Hamidi, A. Zam and **H. Rabbani**, "Modeling of Retinal Optical Coherence Tomography Based on Stochastic Differential Equations: Application to Denoising," vol. 40, no. 8, pp. 2129-2141, *IEEE Transactions on Medical Imaging*. 2021.
  27. E. Golkar, **H. Rabbani\***, and A. Dehghani, "Hybrid registration of retinal fluorescein angiography and optical coherence tomography images of patients with diabetic retinopathy," *Biomed. Opt. Express*, vol. 12, pp. 1707-1724, 2021.
  28. T Mahmudi, R Kafieh\*, **H Rabbani**, AM Dehnavi, MR Akhlaghi, "Evaluation of asymmetry in right and left eyes of normal individuals using extracted features from optical coherence tomography and fundus images”, *Journal of Medical Signals and Sensors*, vol. 11, no. 1, pp. 12-23, 2021.
  29. M. Tajmirriahi, R. Kafieh\*, Z. Amini and **H. Rabbani**, "A Lightweight Mimic Convolutional Auto-Encoder for Denoising Retinal Optical Coherence Tomography Images," *IEEE Transactions on Instrumentation and Measurement*, vol. 70, pp. 1-8, 2021, Art no. 4503908.
  30. M. Samieinasab, Z. Amini and **H. Rabbani\***, "Multivariate Statistical Modeling of Retinal Optical Coherence Tomography," *IEEE Transactions on Medical Imaging*, vol. 39, no. 11, pp. 3475-3487, Nov. 2020.
  31. Z. Amini, **H. Rabbani\*** and I. Selesnick, "Sparse Domain Gaussianization for Multi-Variate Statistical Modeling of Retinal OCT Images," *IEEE Transactions on Image Processing*, vol. 29, pp. 6873-6884, 2020.
  32. N. Teyfour, **H. Rabbani\***, R. Kafieh and I. Jabbari, "An Exact and Fast CBCT
  33. Reconstruction via Pseudo-Polar Fourier Transform-Based Discrete Grangeat’s Formula," *IEEE Transactions on Image Processing*, vol. 29, pp. 5832-5847, 2020.
  34. P. G. Daneshmand, **H. Rabbani\*** and A. Mehridehnavi, "Super-Resolution of Optical Coherence Tomography Images by Scale Mixture Models," *IEEE Transactions on Image Processing*, vol. 29, pp. 5662-5676, 2020.
  35. P. G. Daneshmand, A. Mehridehnavi\* and **H. Rabbani\***, "Reconstruction of Optical
  36. Coherence Tomography Images Using Mixed Low Rank Approximation and Second Order Tensor Based Total Variation Method," *IEEE Transactions on Medical Imaging*, vol. 40, no. 3, pp. 865-878, March 2021.
  37. M. Monemian and **H. Rabbani\***, "Analysis of a Novel Segmentation Algorithm for Optical Coherence Tomography Images Based on Pixels Intensity Correlations," *IEEE Transactions on Instrumentation and Measurement*, vol. 70, pp. 1-12, 2021, Art no. 5002012.

38. M. Behboodi, A. Mahnam\*, H. Marateb and **H. Rabbani**, "Optimization of Visual Stimulus Sequence in a Brain-Computer Interface Based on Code Modulated Visual Evoked Potentials," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, vol. 28, no. 12, pp. 2762-2772, Dec. 2020.
39. M. Momenzadeh, M. Sehhati\*, **H. Rabbani**, "Using hidden Markov model to predict recurrence of breast cancer based on sequential patterns in gene expression profiles," *Journal of Biomedical Informatics*, vol. 111, 2020, Article no. 103570.
40. M. Monemian, **Hossein Rabbani\***, "Mathematical analysis of texture indicators for the segmentation of optical coherence tomography images," *Optik*, vol. 219, 2020, Article no. 165227.
41. X. He, L. Fang\*, **H. Rabbani**, X. Chen, Z. Liu, "Retinal optical coherence tomography image classification with label smoothing generative adversarial network," *Neurocomputing*, vol. 405, pp. 37-47, 2020.
42. R. Almasi, A. Vafaei\*, Z. Ghasemi, M. R. Ommani, A. R. Dehghani, and **H. Rabbani\***, "Registration of fluorescein angiography and optical coherence tomography images of curved retina via scanning laser ophthalmoscopy photographs," *Biomed. Opt. Express*, vol. 11, pp. 3455-3476, 2020.
43. O. Sarrafzadeh, **H. Rabbani\***, A. Mehri Dehnavi, A. Talebi, "Cirlet transform in cell and tissue microscopy," *Optics & Laser Technology*, vol. 124, 2020, Article no. 106000.
44. E. Mousavi, R. Kafieh\*, **H. Rabbani**, "Classification of dry age-related macular degeneration and diabetic macular oedema from optical coherence tomography images using dictionary learning," *IET Image Processing*, vol. 14, no. 8, pp. 1571-1579, 2020.
45. A. Foroozandeh, AA Hemmat\*, **H. Rabbani**, "Online handwritten signature verification and recognition based on dual-tree complex wavelet packet transform," *Journal of Medical Signals and Sensors*, vol. 10, no. 3, pp. 145-157, 2020.
46. A. Foroozandeh, AA Hemmat\*, **H. Rabbani**, "Use of the Shearlet Transform and Transfer Learning in Offline Handwritten Signature Verification and Recognition," *Sahand Communications in Mathematical Analysis*, vol. 17, no. 3, pp. 1-31, 2020.
47. M. Esmaili, A. Mehridehnavi, F. Hajizadeh, and **H. Rabbani\***, "Three-dimensional curvelet-based dictionary learning for speckle noise removal of optical coherence tomography," *Biomed. Opt. Express*, vol. 11, pp. 586-608, 2020.
48. J. Jalili, **H. Rabbani\***, AM Dehnavi, R. Kafieh, M. Akhlaghi, "Forming optimal projection images from intra-retinal layers using curvelet-based image fusion method," *Journal of Medical Signals and Sensors*, vol. 10, no. 2, pp. 76-85, 2020.
49. M. Mokhtari, **H. Rabbani\***, A. Mehridehnavi, R. Kafieh, M. Akhlaghi, M. Pourazizi, L. Fang, "Local comparison of cup to disc ratio in right and left eyes based on fusion of color fundus images and OCT B-scans", *Information Fusion*, vol. 51, pp. 30-41, 2019.
50. M. Kashefpoor, **H. Rabbani\***, M. Barekatain, "Supervised dictionary learning of EEG signals for mild cognitive impairment diagnosis", *Biomedical Signal Processing & Control*, vol. 53, pp. 101559, 2019.
51. Z. Khodabandeh, **H. Rabbani**, AM Dehnavi\*, O. Sarrafzadeh, "The Ellipselet Transform," *J Med Signals Sens.* vol.9, no. 3, pp. 145-157, 2019.
52. M. Momenzadeh, M. Sehhati\*, **H. Rabbani**, "A novel feature selection method for microarray data classification based on hidden Markov model", *Journal of Biomedical Informatics*, vol. 95, pp. 103213, 2019.
53. L. Huang, X. He, L. Fang\*, **H. Rabbani** and X. Chen, "Automatic Classification of Retinal Optical Coherence Tomography Images with Layer Guided Convolutional Neural Network," *IEEE Signal Processing Letters*, vol. 26, no. 7, pp. 1026-1030, July 2019.

54. A Abbasi, A Monadjemi\*, L Fang\*, **H Rabbani**, Yi Zhang, "Three-dimensional optical coherence tomography image denoising through multi-input fully-convolutional networks", *Computers in Biology and Medicine*, vol. 108, pp. 1-8, May 2019.
55. R. Kafieh, **H. Rabbani** and G. Unal\*, "Bandlets on Oriented Graphs: Application to Medical Image Enhancement," *IEEE Access*, vol. 7, pp. 32589-32601, 2019.
56. M. Aghanouri, A. Ghaffari, N.Dadashi\*, H. Rabbani, P. Adibi, "New image-guided method for localisation of an active capsule endoscope in the stomach", *IET Image Processing*, vol. 13, no. 12, pp. 2321-2327, 2019.
57. L. Fang, C. Wang, S. Li, **H. Rabbani**, X. Chen and Z. Liu, "Attention to Lesion: Lesion-Aware Convolutional Neural Network for Retinal Optical Coherence Tomography Image Classification," *IEEE Transactions on Medical Imaging*, 2019.
58. M. Lashgari, M. Shahmoradi, **H. Rabbani\***, M. Swain, "Missing Surface Estimation Based on Modified Tikhonov Regularization: Application for Destructed Dental Tissue," *IEEE Transactions on Image Processing*, vol. 27, no.5, pp. 2433-2446, 2018.
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